# Peer review and evaluation of digital resources for the arts and humanities

**Arts and Humanities Research Council**
**ICT Strategy Project**

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## 1        Introduction

### 1.1        Summary

The mechanisms for the peer review and evaluation of the traditional print outputs of scholarly research in the Arts and Humanities are well established,[1] but no equivalent exists for assessing the value of digital resources and of the scholarly work which leads to their creation. If digital resources are genuinely to contribute to the research profile of UK Higher Education Institutions and form part of the Research Assessment Exercise (RAE), it is essential that a framework for evaluating digital resources, and ensuring quality control, be established. A consistently-applied system of peer review (of both the intellectual content and the technical architecture) would serve to reassure academics and their host institutions of the worth of time spent in the creation of digital resources, establish those types of resource which are of most use and interest to the academic community, contribute to the development of common standards and guidelines for accessibility and usability, and inform proposals to ensure the sustainability and preservation of high-quality scholarly material.

The benefits of funding the creation of digital resources – preservation of fragile materials, increased accessibility, opportunities to develop new methodologies, and so on – are generally accepted, but there remains a cultural preference for the print medium as the primary output for research activity. There are, however, increasing pressures on print and traditional publishing models (for example the continuing decline in the sales of monographs and the rise of the open-access movement), and it is essential for the development of research in the arts and humanities that standards and guidelines be drawn up which will place digital resources on a sound footing and secure due recognition for the scholarly work that goes into their creation.

### 1.2        Context

#### 1.2.1        ICT and research in the arts and humanities

Information and Communication Technology (ICT) is an integral and increasingly important element of academic and scholarly practice,[2] yet barriers to take-up remain. A number of recent reports have identified the training and skills gap that prevents researchers from making best use of the available computing tools and technologies. The British Academy review of e-resources for research, for example, noted that 'while HSS [Humanities and Social Sciences] researchers may reasonably assume they know how to use the traditional non-e tools of their trade, it does not follow they know equally well how to use the new e-tools that are becoming available'. The report recommended that universities, libraries and departments should ensure that relevant and up-to-date training was provided for researchers and also supported the development of 'mutual self-help habits to improve knowledge and understanding of e-resources'.[3] In the United States, where usage of ICT is sometimes presumed to be more firmly embedded than in the United Kingdom, a report by the American Council of Learned Societies noted similar problems: 'if more than a few are to pioneer new digital pathways, more formal venues and opportunities for training and encouragement are needed'.[4]

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[1]    Although there are concerns that even this traditional system of peer review needs to be re-examined. The British Academy, for example, recently launched a review 'to address issues related to the current practice of peer review in respect of publication, including e-publication. The review was established in response to concerns that the system of peer review to assess the quality of research submitted for publication is showing signs of strain, partly resulting from the growth of e-publishing and the number of cases of plagiarism, but also because the increasing specialisation of subjects is making it even more difficult to find suitable referees' (email survey request, 11 September 2006; and see <www.britac.ac.uk/reports/peer-review> [15 September 2006]).

[2]    The Working Group on Search and Navigation, convened by the Research Information Network, rightly asserted that 'electronic information is rapidly becoming the dominant form' (*E-infrastructure strategy – report of the working group on search and navigation* (March 2006), p. 6 <http://www.rin.ac.uk/e-infrastructure-strategy> [8 September 2006]).

[3]    British Academy, *E-resources for research in the humanities and social sciences – a British Academy policy review* (May 2005), p. 105.

[4]    *Our cultural commonwealth: report of the ACLS commission on cyberinfrastructure for humanities and social sciences* (26 July 2006), p. 52 <http://www.acls.org/cyberinfrastructure/acls.ci.report.pdf> [8 September 2006].

There are, in addition, a variety of reasons for the failure of even those academics with the relevant skills both to make full use of digital resources in their research and to devote time to the creation of those resources. Again, the problems are well known and well documented:

- Can relevant resources easily be located?[5]
- Is the scope and content of a resource clearly explained?
- How can the user be sure of the authority of a resource?
- How easy is it to use a resource, and can it be used in conjunction with other resources of similar type and scope?
- Will a resource still be available in five or 10 years time?
- Are there in practice any real benefits to a particular resource being made available in digital format?
- Will work undertaken in the creation of digital resources be given due recognition?

The Arts and Humanities Research Council (AHRC) established its ICT Methods Network to address these issues,[6] complemented by the ICT Strategy Projects scheme. This current project is therefore concerned with one element of a much wider strategic initiative, that is, the importance of peer review and evaluation of digital resources in the arts and humanities, as it affects both creation and usage of those resources.

1.2.2    Peer review and evaluation

Peer review is fundamental to the academic research process. It underpins traditional scholarly publishing, both monograph and journal, and informs the decision-making mechanisms of the UK research councils. The practice of academic journals is of particular relevance in the context of this project, as journal articles are increasingly available in both printed and digital form. Some journals adopt a policy of active commissioning, while others operate in more responsive mode, but the process of peer review is the same in both instances. A researcher submits an article to a journal, selected in part for its standing in his or her field,[7] and it is then sent out to one or more referees, with appropriate advice and input from an editorial board. On the basis of the referees' reports, an article will be rejected outright, recommended for resubmission (after revision), accepted with revisions or, more rarely, accepted without changes. In the majority of cases, double-blind refereeing is used, ensuring that, as far as possible, neither referee nor author is aware of the other's identity. Typically, research which is published in peer-reviewed journals is recognised as having greater authority and will carry more weight in formal assessment processes such as the RAE. The same can be said of monographs published by scholarly presses which employ a rigorous system of peer review, or indeed of peer-reviewed collections of essays.

Bodies such as the AHRC and the Economic and Social Research Council (ESRC) have well-established mechanisms for the peer review of research proposals, including those for projects which involve the creation of significant digital outputs. The AHRC research grants scheme (standard route) will serve to illustrate the process.[8] Applicants are invited to nominate a reviewer who can comment in confidence on the proposal. Both the proposal and the reviewer's report are then considered by two members of the AHRC's peer review college, and a decision is made as to whether the application is of fundable quality. Applicants in most cases now have a right of reply to the peer review college reports. Where a proposal to the AHRC contains a technical element, applicants are required to complete a technical appendix, which is assessed by the Arts and Humanities Data Service (AHDS).[9] All of the documentation is then considered by members of the peer review panel, and a decision as to funding is made.

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[5]    A report commissioned from AHDS History revealed the problems that users can face even when trying to locate resources of which they are already aware – a memorable name and a URL which relates clearly to the resource is essential (p. 12).
[6]    One of the key aims of the Methods Network is 'To promote, support and develop the use of advanced ICT methods in arts and humanities research' <http://www.methodsnetwork.ac.uk> [8 September 2006].
[7]    Other criteria are, of course, significant, e.g. whether or not a particular journal has a strong track record of publication in a particular field.
[8]    Assessment criteria are clearly set out in the AHRC's 'Research funding guide', pp. 47–53 <http://www.ahrc.ac.uk/ahrb/website/images/4_96278.pdf> [8 September 2006].
[9]    AHDS History report, pp. 5–7.

Evaluation of research output is also of considerable importance to the academy, and again there are robust mechanisms in place. Monographs, and less frequently journal articles, are evaluated by means of the published review. The majority of research projects which receive public or charitable funding are required to produce annual and/or 'end of award' reports outlining their progress, explaining their decision-making processes, and addressing any areas in which they have failed to meet their original remit. In some cases, for example ESRC-funded research projects, these reports will themselves be peer reviewed, and they may be made publicly available.

## 2        Terms of reference

### *2.1      The scope of the project*

### 2.1.1    Resources under consideration

There are many different types of digital resource, resource creators and sources of funding, with widely varying imperatives. For example, some of the most significant digital resources for the arts and humanities are produced by commercial organisations (*Early English Books Online*, *Oxford Dictionary of National Biography*, *Eighteenth Century Collections Online*, etc.),[10] while others are produced by libraries, museums and archives (Documents Online, the British Library integrated catalogue, etc.).[11] In addition, valuable resources for research are made available by personal interest and independent researchers and by academics based in HEIs but publishing in a private capacity, for example through their own or departmental web pages. In addition to having different creators, these resources may make available born-digital material or digitise pre-existing information; they might seek to add value, through the implementation of complex metadata schemata or simply put in the public domain materials which are otherwise difficult or impossible to access. A broad division can be seen between traditional scholarship in a new medium, scholarship made possible by the new medium, and collective digital resources for others to use. Would different benchmarks and assessment criteria need to be developed for these categories? Is peer review appropriate for all of them?

A distinction should be drawn between high-profile, commercial resources and others. Many of the most used resources in the survey are commercial (or initially commercially-developed) resources.[12] Members of one focus group convened for this project felt strongly that such resources should be considered as part of the current investigation.[13] However, resources of this type are not necessarily amenable to peer-review processes; there will be different issues for appraisal, different audiences and remits and, perhaps most significantly, different funding arrangements. While some of the findings of this project will be relevant to digital resources of all types, for these reasons it was decided to exclude primarily commercial products from consideration.[14] Nevertheless, there is potential for projects funded by research councils and by commercial suppliers to learn from each other's experiences and to share best practice in the development of common standards and policy.

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[10]    *Early English Books Online* is published by Chadwyck-Healey/ProQuest <http://eebo.chadwyck.com/home> [8 September 2006]; the *Oxford Dictionary of National Biography* is published by Oxford University Press <http://www.oxforddnb.com> [8 September 2006]; *Eighteenth Century Collections Online* is published by Thomson Gale <http://www.gale.com/EighteenthCentury> [8 September 2006].

[11]    Documents Online is one of the many digital resources offered by The National Archives of the UK <http://www.nationalarchives.gov.uk/documentsonline/> [8 September 2006]; the British Library integrated catalogue is at the heart of its web presence <http://catalogue.bl.uk> [8 September 2006].

[12]    Asked to name the three resources which they consulted most often for their own research, 28 per cent of respondents named the ODNB, 13 per cent named EEBO and six per cent named ECCO (n=442) (Survey report, p. 5).

[13]    Focus group notes.

[14]    There are three exceptions to this: the *British Pathe*, National Portrait Gallery Collections Online and Thesaurus Linguae Graecae websites included in the benchmarking survey (<http://www.britishpathe.com> [20 September 2006]; <http://www.npg.org.uk/live/search/> [20 September 2006]; <http://www.tlg.uci.edu> [20 September 2006]). The first two were included to ensure that both image and moving-image resources, which tend to involve at least partnership with commercial and/or MLA bodies, were given due weight; the last to ensure that a key research tool for classicists was assessed.

There is also a worthwhile distinction to be made between resources produced within academia, and those created by bodies in the museums, libraries and archives sector. Such resources will have been developed under different imperatives, with a focus primarily on knowledge transfer rather than on research. While it is clear that many resources in this category involve significant academic input, and quality-assurance mechanisms such as steering and user groups will be integral to their development, they are qualitatively different from resources funded by the UK research councils, and are not generally subject to the same type of initial, formal peer review. Again, however, it is readily apparent that there is scope for research and knowledge-transfer resource projects to adopt elements of each other's processes, particularly since there is considerable overlap in their target audiences.[15]

A third category of digital resource was also deemed not to fall within the scope of the project, that is, those which simply make available online printed secondary sources which have already been subject to traditional peer review and evaluation. As e-monographs are still relatively uncommon, and likely to remain so in the short term, this primarily concerns online journals and journal aggregating services. It might be possible to assess the technical aspects of a service such as JSTOR, but its content – journal articles – has already been evaluated for its intellectual and scholarly merit.[16] Interestingly, an online survey conducted by the Resource Discovery Network (now Intute) found that 'a minority of researchers … thought of online resources almost exclusively in terms of journal articles', but this only serves to highlight the importance of embedding truly innovative digital scholarship in arts and humanities research practice.[17]

Many of those who took part in the project consultation emphasised that digital resources for research and digital resources for teaching could and should not be considered independently of one another – particularly as a single resource might fulfil both functions. Classroom application is seen as integral to end-user impact,[18] as well as the importance of developing critical evaluation skills among students. Nevertheless, for the purposes of this project, it was decided to maintain the artificial distinction and to concentrate on resources only as they are used for research.[19] For similar reasons, the project also largely confined itself to considering resources based in Britain and Ireland, although it is clear that digital resources are accessed on a supra-national basis, and that 'physical' location is irrelevant to their impact (as can be seen from the results of the project survey).[20] Furthermore, since the results of the survey indicated that most users preferred online versions of a resource where a choice was available (74 per cent), most of the resources considered by the project are delivered via the web (rather than, for example, as a CD-ROM).[21]

Although the project team, and many of those who took part in the consultation process, fully recognise the value of these different types of resources, and the potential of the web for making scholarship available to all, for the reasons outlined above it was decided to concentrate on those research resources created by academics in Higher Education Institutions, with research council funding. These include resources that facilitate research either by providing bibliographical finding aids or digitised primary or secondary material, and research projects which have a digital output (for example a prosopography, a searchable database, a dataset, etc.).

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[15]    One focus group noted that there is 'tension between the competing agendas of knowledge transfer and research, both government-driven'; 'focus group members representing museums and archives … felt their sector is caught in the middle'. Although resources generated from the museums, libraries and archives sector were deemed beyond the scope of the project, care was taken to ensure that representatives of this community were consulted throughout.

[16]    JSTOR maintains an interdisciplinary archive of more than 600 journals in the arts, humanities and social sciences <http://www.jstor.org> [8 September 2006].

[17]    J. A. J. Wilson and M. Fraser, *Intute: supporting the research community – a requirements report* <http://www.intute.ac.uk/artsandhumanities/IntuteResearchSupportReport.doc>, p. 8 [25 September 2006].

[18]    Focus group notes.

[19]    There are other projects examining the usage of digital resources for learning and teaching, including one hosted by the Higher Education Academy with which the findings of this project have been shared.

[20]    Survey report.

[21]    Survey report, p. 8.

### 2.1.2   Disciplinary coverage

While the focus of the project, and of this report, is on history, scholars in other disciplines have been consulted at every stage. The project was led by the Institute of Historical Research (IHR) and the Royal Historical Society (RHS), but there was representation from classics both among the project applicants and on the Advisory Board, and a complementary report was commissioned from the Archaeology Data Service (ADS)/AHDS Archaeology. The project survey was disseminated widely, to ensure maximum exposure across disciplines, and this is reflected in the responses received.[22] Several of the digital resources identified for inclusion in the project's benchmarking exercise were selected in part for their interdisciplinarity.

In general, and with the exceptions to be noted in the ADS/AHDS Archaeology report, differences between disciplines were not as great as expected – the same concerns about quality, scope, authority, career progression and sustainability were raised time and again in a variety of forums. Consequently, the project team is confident that its recommendations are widely applicable to arts and humanities research, and not just to history and cognate disciplines.[23]

### 2.2   Terminology

This is not the place to provide a glossary of humanities and humanities computing terminology, but a number of terms employed in this report have a project-specific interpretation.

Peer review – For the purposes of this project, peer review is understood to mean the formal assessment of proposed research. It is undertaken at a sufficiently early stage to influence the course of that research, the nature of its outputs, and ultimately even whether it takes place at all (or is made available to a wider audience). It is usually undertaken by a single academic working in a related field, or by a group of subject experts.

Evaluation – The project distinguishes between two types of evaluation: that which takes place at, for example, the end of a research project as part of a formal process; and that which is undertaken by end users, whether informally as part of a feedback process or in publicly-available reviews. In the context of digital resources, evaluation is most usefully seen as part of an ongoing and iterative process. Digital resources require varying degrees of technical and academic input over time, but few can be said to be 'complete' in the way that a book or journal article is complete once published. Evaluation, or at least some elements of it, can be undertaken without the presence of peers (for example an assessment of whether a check-list of technical requirements has been met would not require subject knowledge).

As the project developed, the utility (and even clarity) of the terms 'peer review' and 'evaluation' was called into question, and it was suggested that it might be more helpful to think in terms of a multi-staged assessment process for research projects with digital outputs, incorporating pre-award review, pre-completion review (ongoing, perhaps annual, check ups), post-completion or pre-publication review, and finally post-publication review (that is, review in a scholarly journal or other forum).

Digital resource – Any material useful for research which is made publicly available in a digital format (digital resources are, of course, frequently created by researchers solely for their own use, but these are not under consideration here). The digital resources noted in this report are primarily those generated by research council-funded projects, with a well-defined and coherent intellectual justification and structure.

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[22]   Respondents to the survey questionnaire were asked to identify their areas of interest. History was broken down into various categories, e.g. 'Cultural history', 'Gender and women', but 134 respondents indicated 'Archaeology'; 53 indicated 'Literature and history'; 43 indicated 'Art history'; 39 indicated 'Ancient history'; 25 indicated 'Palaeography and diplomatic'; 6 indicated 'Papyrology'; and 5 indicated 'Epigraphy' (respondents were able to tick multiple categories).

[23]   There are, of course, unique issues associated with the visual arts, but some, if not all, of the project's recommendations have bearing.

Resource creator – Anyone involved in the production of digital material which will ultimately be made publicly available. This can mean a lead applicant on a research project, or the most junior project officer.

User – Anyone accessing a publicly-available digital resource. By the nature of the resources under consideration here, the majority of users will be arts and humanities professionals, but the requirements of non-professional users are clearly of significance.

## 3    Methodology and progress of project

### 3.1    Project boards

Two project boards were established: a main Advisory Board, drawn from the academy (history and classics); and a Technical Advisory Group, drawn from leading humanities computing practitioners. The members of the Advisory Board represented a wide range of host institutions, with varying degrees of access to both digital and analogue resources. The Advisory Board met three times during the course of the project (in November 2005, January 2006 and July 2006). Meetings of the Technical Advisory Group were held on the same days in January and July 2006.[24] Members of both boards were consulted regularly by email throughout the project.

### 3.2    Consultation

### 3.2.1    Online survey

The project's first step to canvassing opinion from the research community was to mount an online survey. The intention was to gather opinions from a broad cross-section of the historical, classical and archaeological research community, including independent and personal interest researchers as well as academics and research students. Although the project is primarily concerned with the views of the academic (HEI) community, digital resources for the arts and humanities have a much wider appeal and audience, and it is important that there is at least attempt to address the needs of these users as well. The survey questions were designed to elicit opinion as to the usage of digital resources, and no distinction was made between those who are solely consumers of digital resources and those who are both consumers and creators.

The survey was published on the IHR website and there were links to it from the websites of the Royal Historical Society Bibliography and the Institute of Classical Studies.[25] It was available from 15 November 2005 to 16 January 2006, and respondents were offered the opportunity to be entered into a prize draw (a £50 Amazon.co.uk token). The survey was circulated through various channels, including IHR mailing lists and seminars, JISC email lists, ADS/AHDS Archaeology and AHDS History mailing lists. Personal approaches were made to digital resource creators at the Royal Commission on the Ancient and Historical Monuments of Scotland (RCAHMS), the Royal Commission on the Ancient and Historical Monuments of Wales (RCAHMW), English Heritage, the British Library, the Victoria and Albert Museum and the National Library of Scotland.

A full report on the survey questionnaire is available on the Institute of Historical Research website, at www. history.ac.uk, but key findings are summarised here.

The survey received a total of 777 responses, of which 365 were full (that is, respondents worked their way through to the end of the survey, perhaps leaving one or two questions unanswered). Respondents were first

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[24]    The November 2005 meeting of the Technical Advisory Group proved impossible to convene, but meetings were arranged with the individual members in the course of November and December.

[25]    Institute of Historical Research <http://www.history.ac.uk> [8 September 2006]; Royal Historical Society <http://www.rhs.ac.uk> [8 September 2006]; Institute of Classical Studies <http://icls.sas.ac.uk/> [8 September 2006].

asked a series of questions designed to place them in context: their age, the nature of their host institution, if any, their geographical location, their occupation and their area(s) of research interest. The highest numbers of respondents were in the age cohorts 36–50 (34 per cent), 25–35 (28 per cent) and 51–65 (22 per cent). The majority came from UK Higher Education institutions (56 per cent), while 58 per cent were located in Britain and Ireland (a further 24 per cent were based in Europe). A total of 122 respondents (22 per cent) identified themselves as research students, and 101 as academics of the status of senior lecturer or above (18 per cent). The most popular areas of interest were social history, archaeology and cultural history; the most popular periods the 19th and 20th centuries, followed by the 17th and 18th centuries. Britain and Ireland was the most popular geographical area of study, with the rest of Europe second. There was, given the nature of the project and the methods of dissemination of the survey, a low level of response from outside the academic community, and it is recommended that steps should be taken either to consult this group at a later date or to make use of survey data from, for example, the museums, libraries and archives sector.

The remainder of the survey was designed to highlight those resources which were thought by the user group to be both valuable and significant, and to identify criteria for their assessment. The responses informed the subsequent development of the project, suggesting the questions that should be followed up with focus groups and in interviews, and shaping the 'Guidelines for reviewers' which underpinned the benchmarking exercise (Appendix 1).

Responses to survey question six ('Name the three digital resources which you use most often in your own research') identified access to information or source material, searchability, comprehensiveness and speed or convenience as attributes of digital resources that the users most valued. Reponses to question eight ('Can you specify features you have found unsatisfactory in digital resources you have used?') focused on two main issues: gaining access to content; and the nature and reliability of that content. Regarding access, problems with the searchability of resources were cited most frequently, but there were also concerns ranging from the inability to access a resource at all (whether because of cost or some other factor) to finding it impossible to make use of resource content because of lack of downloading or printing facilities. Several respondents, however, mentioned that access of any sort was better than none. Issues relating to content included concerns about coverage (with some resources giving a misleading impression of completeness), accuracy and scholarly standards. One respondent identified the unsatisfactory nature of digital resources 'designed on the model of a printed work, rather than employing the full functionality made possible by electronic [media]'.[26]

Question nine ('What is important in determining the value of a particular digital resource for your own research?') revealed that 79 per cent of respondents found content to be extremely important, falling to 43 per cent for authority, 40 per cent for the lack of availability/accessibility of the original analogue material, 36 per cent for comprehensiveness, 34 per cent for usability, 32 per cent for permanence, 30 per cent for the ability to conduct complex searches, 24 per cent for clarity of presentation and 23 per cent for transformative impact. In all but one of these instances, the number of respondents indicating that these criteria were either not very important or completely unimportant was small or negligible: availability/accessibility of original (14 per cent); permanence (13 per cent); searchability (12 per cent); clarity of presentation (nine per cent); authority (eight per cent); comprehensiveness (eight per cent); usability (six per cent); and content (five per cent). The one exception relates to the transformative impact of a digital resource, with 21 per cent of respondents indicating that this was either not very important or of no importance (this despite the comment of one respondent that 'These resources evidently and dramatically change the way historians can work').[27] This suggests that researchers do not always recognise, or articulate, the transformative impact of digital resources on their research practice – even a poorly delivered digital resource can have such an impact if it makes available hitherto inaccessible material. Clearly, all of the considerations presented to survey respondents were felt, to a significant degree, to be important when evaluating a resource for use in personal research.

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26   Survey report, p. 11.
27   Survey report, p. 7.

Responses to question 11 ('What do you regard as they key assessment criteria for digital resources?') indicated that users considered content to be the most significant factor, followed by usability, and then other, related issues such as navigation and searchability. A total of 131 respondents (33 per cent) mentioned issues to do with content, ranging from quality and reliability to provenance;[28] 80 (20 per cent) listed usability; 26 accessibility (seven per cent); 20 searchability (five per cent); and 18 comprehensiveness (five per cent).

Finally, and most significantly for this project, 71 per cent of respondents considered peer evaluation and recommendation to be either important or extremely important in their selection of digital resources for use in their personal research. A number of respondents commented on the need for some formalisation of this process: 'It would be most helpful to have an online space where scholars could "review" specific resources and leave comments and questions about them … it is rare for a scholar to be able to speak directly with the people who actually designed and implemented a resource, and to compare notes with other scholars about it in the presence of those people and with the program itself up and running'; 'serious refereeing of digital publication is extremely important'; 'peer review and provenance are key for me – I can get non-peer reviewed material anytime through Google and evaluate its usefulness myself. It is no substitute for the academic resources'.[29]

### 3.2.2    Focus groups

A number of focus groups were convened from December 2005, the aim of which was to investigate in greater depth the issues raised by the project survey. Care was taken to ensure that all of the key stakeholder groups were represented, including archaeologists, classicists, museums, libraries and archives professionals, resource creators and humanities computing specialists, as well as research-active academics and research students.

It was agreed by the Advisory Panel that these groups, originally conceived as being organised by broad historical period, should instead be organised on a geographical basis. Focus groups were held in London (13 December 2005), Glasgow (8 February 2006), York (8 March 2006) and Bristol (20 February 2006). A separate resource creators' meeting was also held (London, 20 June 2006), in recognition of the unique perspective of those involved in both the production and consumption of digital resources. A supplementary meeting with staff at the Centre for Computing in the Humanities (CCH), King's College London took place on 1 September 2006. Either the project administrator or one of the project applicants was in attendance at all of these meetings, with the exception of the focus group convened at the University of Bristol.

While discussions were wide-ranging and varied, participants were asked to focus on the following questions:

• Which digital resources do you use most frequently, and why; which are unsatisfactory?
• Typically, how do you locate digital resources of value for your personal research?
• Which resources would you be prepared to pay for; and which should your host institution make available?
• What criteria are important when evaluating digital resources, and is it possible to design criteria which are applicable to all?
• How would the peer review and evaluation of digital resources operate; and how would it differ, if at all, from traditional mechanisms?
• Would a system of kitemarking, or similar, be useful and/or desirable?

Key findings from the focus groups are included in the 'Outcomes' section (4) below.

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[28]    Comments included: 'Content is all-important – its accuracy, accessibility, longevity, acceptance of the resource by peers'; 'Content (and types of indexing and searching) are critical … if there was vital content it should be assessed high even if it had a non-standard and poorly-designed interface'; and 'If the content is useful enough, I can look past usability problems. On the other hand, I can see why institutional subscribers would value the other two criteria highly' (Survey report, pp. 21, 22). This last is an interesting example of the tendency of some respondents to assume that they could be trusted to assess the value and significance of a particular digital resource, while others could not.
[29]    Survey report, p. 25.

### 3.2.3    Interviews

During August 2006, the project administrator conducted interviews with seven key stakeholders in the fields of history, archaeology, information services, and humanities computing, from institutions including The National Archives of the UK, the AHDS, University College London, and the University of Glasgow.

The purpose here was to collate in-depth perspectives from key individuals with experience of the creation, preservation and purchase of digital resources. The interview questionnaire was drawn up by the project administrator to reflect the issues highlighted in the survey report and by the various focus groups.[30] Again, key findings are included in the 'Outcomes' section (4) below.

### 3.3    *Benchmarking*

A major part of the project was a benchmarking study of a range of digital resources for history, archaeology and classics. The resources were chosen to reflect the spectrum of available digital resources (according to the schema established by the AHDS),[31] incorporating image and moving-image resources as well as editions, databases, interactive maps, etc. The resources identified for inclusion in the benchmarking study were:

- British Pathe (http://www.britishpathe.com)
- Centre for the Study of Cartoons and Caricature (http://library.kent.ac.uk/cartoons/)
- Clergy of the Church of England Database (http://www.theclergydatabase.org.uk)
- The Isaac Newton Project (http://www.newtonproject.ic.ac.uk)
- The Proceedings of the Old Bailey, London 1674–1834 (http://www.oldbaileyonline.org)
- Prosopography of Anglo-Saxon England (http://www.pase.ac.uk)
- Science in the Nineteenth-Century Periodical (http://www.sciper.org)
- The Work Diaries of Robert Boyle (http://www.livesandletters.ac.uk/wd/)
- National Portrait Gallery Collections Online (http://www.npg.org.uk/live/search/)
- British History Online (http://www.british-history.ac.uk)
- Vindolanda Tablets (http://vindolanda.csad.ox.ac.uk)
- John Foxe Variorum Edition (http://www.hrionline.ac.uk/foxe/)
- Aphrodisias in Late Antiquity (http://insaph.kcl.ac.uk/ala2004/)
- Thesaurus Linguae Graecae (http://www.tlg.uci.edu; available as CD-ROM or by online subscription)
- Historical Parishes of England and Wales (CD-ROM, published by AHDS)
- Narrative Sources from the Medieval Low Countries (http://www.narrative-sources.be)

Drawing on the results of the project survey and early focus groups, the Advisory Board constructed guidelines for reviewers, highlighting those elements of a resource which should be included, and suggesting ways in which they might be evaluated.[32] The intention was to provide an outline that might be used as a guide to best practice, to encourage diffident reviewers to engage with the sources in question.[33]

Given the complexities involved in the assessment of digital resources, a number of different methods were explored:

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[30]  Transcripts of these interviews have not been published, as the project team did not feel it was appropriate to attribute comments to individuals.

[31]  Reto Speck, *The AHDS taxonomy of computational methods* <http://www.ahds.ac.uk/about/projects/documents/pmdb_taxonomy_v1_3_1.pdf> [25 September 2005].

[32]  Appendix 1.

[33]  This diffidence has to be recognised and addressed if successful mechanisms for peer review in particular are to be established. There are clearly unique elements to the review of digital resources, but many of the underlying scholarly principles are the same as those for more traditional research outputs.

1      A short review (*c*.1,000 words), by a subject specialist, of the type that might be published in a scholarly journal.

2      Four reviews were commissioned by the IHR's online journal, *Reviews in History*.[34] These differ from the first category of review in two key elements: length and the option for the 'author' of the resource to respond in a public forum to any comments, positive or negative.

3      In the case of five resources, a much more in-depth review was undertaken by AHDS History, focusing on the 'technical' elements of the resources, but also examining those 'scholarly' aspects which it is impossible to disentangle from the technical.[35] In four instances, members of the project team were interviewed, and in all five an extensive review of the technical apparatus was undertaken. Reviews of three of the five resources were also commissioned under method (1) above, for comparative purposes.[36]

The three approaches to review and evaluation clearly differ in nature, and reflect two of the stages at which, in the view of the project team, digital resources should or are likely to be assessed: that is, post-completion and post-publication. They also take account of the different constituencies being addressed: for example, the third method of review – an in-depth and resource-intensive technical assessment – has relevance for the general user but would be of most benefit to a funding body seeking to establish whether or not a project has delivered results that are not only valuable but also conform to the original project outline (and if not, why not).[37]

The benchmarking exercise revealed a number of important factors to be taken into consideration when establishing a successful mechanism for review and evaluation:

- The importance of a panel of subject (and humanities computing) specialists in identifying suitable reviewers for digital materials. This panel (or panels, if the model is adopted by disciplines other than history) fulfils much the same function as a traditional editorial board, with members either suggesting reviewers or undertaking reviews themselves. There is a role for learned societies and subject organisations, such as the RHS and IHR, in mediating this process, with reviews effectively carrying their imprint.
- A concern raised at an early stage of the project was that a key element of the traditional print review process is the receipt, and retention, by the reviewer of the product to be reviewed. With the possible exception of CD-ROMs, this is not an option where digital resources are concerned – a reviewer might be granted time-limited access to a subscription-based product, but no more. In practice, this proved not to have an adverse affect on scholars' initial willingness to conduct a review. The numbers of those involved in the creation of digital resources, and consequently with an interest in having their value publicly recognised, may explain the readiness of researchers to participate in the process with no apparent 'physical' reward.
- Under methods (1) and (2), above, reviewers were chosen primarily on the basis of their subject expertise, reflecting the emphasis on content that emerged at every stage of consultation. Reviewers, however, generally showed themselves to be capable of striking a balance between assessment of content, added value, functionality and impact. This may be indicative of the utility of the guidelines: two reviewers, for example, chose to follow the headings provided.[38] Where reviews were undertaken by both the AHDS (concentrating on technical elements) and an academic reviewer (e.g. the Robert Boyle Workdiaries), many common elements emerge.[39] There are, of course, differences in emphasis,

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[34]  *Reviews in History*, established in 1996, publishes reviews of *c*.3,000 words and since its inception has offered authors a right of reply <http://www.history.ac.uk/reviews/> [8 September 2006].

[35]  AHDS History report, pp. 9, 23–33.

[36]  Focus group notes.

[37]  Such a review would also, of course, be of benefit to the resource creators. The opportunity for constructive dialogue was welcomed by all of the project teams interviewed by AHDS History for this report.

[38]  Focus group notes.

[39]  Both, for example, focus on the importance of documentation.

ultimately reflecting the different purposes of the reviews: one is designed primarily for consumption by the resource creators and their funders, perhaps forming part of an iterative assessment process; the other is for public consumption, both more general in nature and of more obvious immediate use to the end consumer.

- While what might be termed the 'academic' review could be seen as the end of the process, as with a book review, there is clear benefit to be had from allowing resource creators a right of reply.[40] This allows the resource creator(s) to engage in constructive dialogue with the reviewer, to answer criticism (for example, features identified as desirable might have been considered by the project team but rejected because of funding constraints) and, where ongoing funding is available, to incorporate suggestions. This cannot be achieved without an open and transparent review process.

- It need, and indeed should not be the responsibility of a reviewer chosen for his or her subject expertise to establish whether a particular resource has met certain basic technical standards (for example compliance with W3C WAI).[41] This is a qualitatively different exercise from the evaluation of the usability and functionality of a resource, and could be carried out in a relatively automated fashion, using a check-list such as that provided in Appendix 2.[42]

## 4      Outcomes

### 4.1      The importance of digital resources

Digital resources have already transformed the ways in which research in the arts and humanities is conducted, and their impact will only increase as new technologies develop and new research materials become publicly available. This is particularly apparent in archaeology, where use of digital resources is more firmly embedded than in the other humanities disciplines surveyed.[43] Digital resources can change working processes by making material more easily accessible, by making it possible quickly and easily to link sources together, and by providing time-saving search and browse facilities. They can also, however, change the nature of the research that is undertaken, allowing historical and other material to be interrogated in completely new ways, and driving new research questions and agendas. There is a clear recognition of this within the profession, even among those who have yet fully to engage with the altered research landscape.[44] The ready availability of digital resources online, either free or free at the point of use for researchers in higher education institutions, is significant here. Project participants commented that digital resources offer 'tremendous potential for the democratisation of scholarship', but this is dependent upon the existence of publicly-funded, open-access resources.[45]

### 4.2      The need for peer review and evaluation

Related to the question of ease of access is that of ease of publication of digital material. At a very early stage in the project, several participants expressed the opinion that the digital environment made the very concept of peer review irrelevant – that it was, in effect, imposing a gatekeeper where there was no gate. This is one

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[40]   As with reviews commissioned for *Reviews in History* (for recent examples, see <http://www.history.ac.uk/reviews/paper/> [28 September 2006]).

[41]   The World Wide Web Consortium's Web Accessibility Initiative recommendations <http://www.w3.org/WAI/> [20 September 2006].

[42]   AHDS History report, pp. 42–5.

[43]   This is to be expected, given the intersection between archaeology and scientific disciplines.

[44]   One focus group participant commented 'because it's been suggested that Old Bailey Online has completely changed the way people are able to interrogate legal records, it's changed the practice of history from below when it comes to criminality … there's a whole academic process going on around the generation of e-resources like Old Bailey Online' (Focus group notes). However, see above p. 9, regarding the transformative impact of research.

[45]   Focus group notes. One respondent to the project survey expressed the access dilemma in reference to the ProQuest historical newspaper database: 'it would take years to do what you can accomplish in a few hours, if you are at an institution with [a] subscription!' (Survey report, p. 7). A recent Research Information Network report has addressed the problem of wider public access (Research Information Network, Access for members of the public to digital content held in university and college libraries: a report on current practice and recommendations for the future <http://www.rin.ac.uk/files/Public%20Access%20to%20Digital%20Content.pdf> [15 September 2006].

of the key differences between traditional print and digital publication: if the creator of a particular resource, whether a dataset or a scholarly article, is unconcerned about the opinion of his or her peers, then it is possible simply to publish material on a personal website, to leave it to users to decide whether or not they wish to consult it. Such a model allows for the possibility of de facto evaluation, in that a 'good' resource will attract high levels of usage, but this is not satisfactory in an academic context.[46] In purely practical terms, however, there is no longer any requirement to submit work for peer review in order to make it available in the public domain.[47] Nevertheless, the importance placed on peer review emerged clearly in the project survey.[48] The question of the authority of a particular resource, however defined, was also noted.[49] Precisely because it is relatively easy to publish online, transparent procedures for peer review and evaluation are vital if digital resources are to be used to their full potential.

The project team identified several, overlapping constituencies for whom the peer review and evaluation of digital resources is of some significance:

• Funding bodies – Organisations, whether public or private sector, which fund the creation of digital resources require mechanisms to assess whether a particular project should be supported, whether it successfully meets its aims and objectives, and ultimately whether it has in some sense delivered value for money.

• Resource creators – The individuals involved in the creation of digital resources are, of course, also consumers, but they have unique concerns to do with career development and the recognition of research activity. These concerns are particularly apparent in the field of humanities computing (see below, section 4.5), but to some degree affect all of those who contribute their time and expertise to research projects with a primarily digital output.[50] Robust systems and criteria for the peer review and evaluation of digital resources are essential if this problem is to be addressed.

• Host institutions – The universities which host such projects are concerned to demonstrate the existence of a thriving research culture and consequently require their academic staff to produce work which is valued highly both by its consumers and in exercises such as the RAE.

• Users in higher education – The consultation undertaken during this project highlighted the need for a system of peer review and evaluation which would assist academic users in making decisions about which digital resources were appropriate for their own research. Students, both undergraduate and postgraduate, were identified as being particularly in need of guidance.[51]

• Users outside higher education – While this group of users largely fell outside the scope of the project, their needs also have to and should be considered by resource creators and funding bodies. For this group, peer review and evaluation both ensure that public money is well and wisely spent and allows them to identify material upon which they can rely.

[46] A resource such as Wikipedia is enormously successful in terms of both usage and impact, for example, but the lack of perceived authority, in that articles are unattributed and information sometimes unreliable, is a barrier to its use for scholarly research <http://www.wikipedia.org> [15 September 2006].

[47] 'The web has made publication so easy that it's no longer necessary to get peer reviewed to get published. There's no incentive to peer review' (Focus group notes). It has, of course, always been possible to publish work in print without peer review, but it is not an inexpensive process.

[48] See above, p. 10.

[49] The 'authority' of a particular resource was deemed by survey respondents to be the second most important factor in determining its value for research (see above, p. 9).

[50] 'People put a huge amount of time into creating their resources, and then really there's no mechanism for recognising that; I know in the RAE technically you can put in an electronic resource, but it doesn't count for much, and they don't know how they're going to assess it; so if you had a three-year project and you've invested a huge amount of time and effort into producing something, and then you don't really get a huge amount of recognition for it, that's quite a disincentive at times for people to continue doing that kind of work' (Stakeholder interview).

[51] 'Whether or not we want students to use … e-resources … we know that when we send them off to do some independent research they're going to start plundering them. And plunder is exactly what you get back. A range of unmediated, ill-considered pillages from the archive in great quantities'; 'there is a sense in which students are being made aware that they must realise that they can't simply rely on the quality of what they find on the internet. Which of course throws a lot more responsibility onto them. If something is printed, on the whole it has a certain degree of authority' (Focus group notes).

The digital landscape is continually evolving; standards and technologies are fluid, and likely to remain so for some time to come. Consequently, assessment criteria and research potential are not yet clearly defined; or more accurately there are many different, and sometimes conflicting, definitions.[52] What has become apparent in the course of consultation is that an entirely new system of peer review and evaluation is not required, and indeed that it would be damaging to replace wholesale the established methods of assessing and evaluating publicly-funded research projects with a substantial digital output. Rather, the existing review structures should be developed to meet the specific challenges of the digital environment. Above all, peer review should retain its character as a measure of esteem.

*4.3     The process of peer review and evaluation*

Peer review and evaluation can broadly be divided into two stages: pre-completion or formative review, and post-completion or summative review. Formative peer review may take place at the initial proposal stage, when it is decided whether or not a particular project merits funding, and subsequently during the lifetime of the project, typically at regular biannual or annual intervals. There are clear differences between this process and that adopted for the peer review of scholarly articles and monographs: first, the initial review is of a concept rather than of a more or less complete piece of work; second, there is an ongoing review of the research process, not just a one-off review of its outcomes. This type of ongoing assessment was welcomed by many of those consulted during the survey, and there was recognition that there should not just be a 'signing-off' exercise at the beginning of a project.[53] The Joint Information Systems Committee (JISC)[54] was cited as an example of a funding body which uses steering and evaluation groups to oversee funding programmes or, if this cannot be managed, asks local steering groups to report back to programme boards. This creates a mechanism both for ensuring the effective monitoring of projects, and for allowing project teams to receive useful feedback from their peers. Many of the resource creators consulted during this project were also concerned that even this should not be the end of the process, placing a high value on the option to respond positively to criticism and to address any perceived misunderstandings. Access to ongoing evaluation would be helpful for projects funded by the AHRC, but this is not to recommend constant monitoring, which would be both prohibitively resource intensive and stifling of creativity.

The question of *when* summative evaluation or review might take place is also important. In most cases, formative evaluations are not widely published, if at all, but the public availability of summative evaluation would be of enormous benefit to all of the stakeholders in a research project: funders, resource creators and users.[55] This does, of course, also raise the question of assessment over a much longer period of time, beyond the initial funding stage, again with obvious resource implications.[56]

4.3.1     Initial and pre-completion peer review and evaluation

There was a consensus among those consulted during the project that the AHRC's peer-review procedures for digital resources, both at the beginning and at the end of the process, need to be reformed.[57] For example, the AHRC application form, and particularly the technical appendix, are viewed as being too formulaic to

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[52]   'I suspect we've all got subtly different views on what constitutes good quality in e-resources, and we are really still feeling our way to a scholarly appreciation of these evolving resources' (Focus group notes).

[53]   'There's no point spending five years developing something only for people to find it's rubbish … it needs to be an iterative process as the e-resource continues to be developed' (Focus group notes).

[54]   The Joint Information Systems Committee <http://www.jisc.ac.uk> [20 September 2006].

[55]   'Certainly the results of the summative evaluation should be debated in public and made available to the community via conferences, via wikis, via email discussion lists, whatever mechanism you're going to use to disseminate' (Stakeholder interview); '[a digital resource is] not like a book – you finish a book, you publish it, and it will always be in that form. A website is never going to be "finished" in that sense' (Focus group notes).

[56]   '… there also needs to be longer-term assessment, say looking back in five years, did it really matter that we funded this; and then ten years out… when you look at the impact of funding we need to do that over long periods of time' (Stakeholder interview).

[57]   One survey respondent, perhaps unfairly in the context of the investment in this current project, noted that: 'serious refereeing of digital publication is extremely important … as someone who works on the fringe of this field I find it frustrating that the powers-that-be do not always take [digital resources] seriously' (Survey report, p. 25).

allow applicants fully to discuss their technical plans, and therefore too formulaic to be helpful to peer review panels. One interviewee felt quite strongly that in fact the appendix was not so much a test of applicants' ability to undertake the project technically, but, because of the circular nature of AHDS input into both the technical appendix and the peer-review process at the AHRC, 'a test of listening ability as much as anything'. In much the same way as schoolchildren are said to be good at passing examinations rather than possessing genuine knowledge of the subject, humanities researchers, or staff in the computing departments of their host institutions, are becoming good at filling out the forms. The technical appendix is no longer a true indicator of either aptitude or the existence of a genuinely robust methodology.[58]

It was thought desirable that there should be a much more detailed and in-depth technical element to the application process. This would, of course, increase the amount of work that has to be undertaken by applicants at a preliminary stage, when there is absolutely no guarantee or even likelihood of securing funding. One solution might be the adoption of a two-stage model: an initial, summary proposal would be assessed for academic merit ('proof of concept'); applicants successful at this first stage would then be invited to submit a full proposal, including much more detailed technical information and a fully worked-out project plan. While some proposals approved for the second stage would, of course, still be rejected, the risk of applicants expending considerable time and effort on an unsuccessful bid would be reduced. This two-stage approach would serve both to emphasise the importance of content and scholarly value and to introduce greater rigour at the planning stage for the technical and management aspects of research projects.

Any such process should not be seen as perpetuating the 'division' between the academic and the technical; indeed, it might be argued that the existence of a separate technical appendix, as at present, encourages applicants to view project planning, data modelling etc. as adjuncts to an academic research project rather than as integral to its intellectual justification and successful delivery. More, and better-informed, communication between humanities researchers and computing or computer science departments was welcomed by many of those consulted during the project. The specialist humanities computing centres, such as the Centre for Computing and Humanities at King's College London and the University of Sheffield Humanities Research Institute (HRI),[59] are especially well regarded, and several participants felt that further collaboration with such centres should be encouraged by the AHRC and other funding bodies, if not made a condition of grant.[60] Full collaboration was seen as more beneficial than the expertise of such centres being made available through consultancy or advisory services.[61] Their input might also be encouraged during the application stage, but there was a strong argument in favour of involving them more closely in the peer-review process, at least while there are concerns about the skill set of the available pool of reviewers.[62]

Some issues are difficult to assess at the pre-funding stage, even where a proposal is well constructed. All contributors recognised the importance of retaining flexibility throughout the lifetime of a project, allowing resource creators to engage with unforeseen problems and to take advantage of new developments. Where departures from an original project plan are justified, on scholarly and/or technological grounds, resource creators should not be penalised by the evaluation process.[63]

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[58]    See also AHDS History report, pp. 5–9.

[59]    Centre for Computing in the Humanities, King's College London <http://www.kcl.ac.uk/schools/humanities/cch/> [20 September 2006]; Humanities Research Institute, University of Sheffield <http://www.shef.ac.uk/hri/> [20 September 2006].

[60]    '[Working with AHDS is] an opportunity for new digital resources to take advantage of expertise, and it seems reasonable for this to be enforced by funding bodies such as the AHRC' (Focus group notes); '[the data centres] are the unsung heroes of the research councils … [they] have a subject focus [and] have good contacts with academic creators of content and technical software developments' (Stakeholder interview); working with specialist humanities computing centres 'should be a condition of grant … proof of this partnership working or joint working [should be] shown in any bid or any work that's being undertaken' (Stakeholder interview).

[61]    'The centres tend to be seen as service providers rather than collaborators, and I think we need to overcome that impression in people's minds'; 'I think we need a much more creative relationship between academics, computing scientists, humanities technologists, and archives and curators, so that we're… working in partnership right from the point of creation of a resource, through the whole of its lifecycle, and on, so that it's a constructive collaborative relationship' (Stakeholder interviews).

[62]    The involvement of such centres and departments, in both the application and review processes, would, of course, have to be managed in such a way that there were no conflicts of interest.

[63]    See also section 4.3.4 below.

This raises questions of change management, both for the creators of digital resources and for those organisations such as the AHRC which fund this work. In a rapidly changing environment, it would be an unusual three-year project which was able to deliver exactly what was initially proposed, and in exactly the same way. Adequate, and adequately assessed, project management structures are crucial in this context.[64] This is again not to argue for intrusive 'monitoring' of the day-to-day management of research projects; rather, the mechanisms of peer review should ensure that project applicants are aware of and have addressed these issues realistically and thoughtfully.

### 4.3.2    Post-completion review and evaluation

The current system of post-completion review and evaluation is felt by many to be both somewhat opaque and inadequate for the needs of a wide variety of stakeholders. A major concern of resource creators in particular is the perceived inadequacy of the current system of 'end of award' reporting. At one focus group it was noted that 'decisions are made without reference to end-of-project evaluation reports sent to the [AHRC] Monitoring and Evaluation Committee, although these can include valuable information about problems encountered and solutions achieved'.[65] An interviewee commented that 'My experience of AHRC-funded projects is that you send in the report and that's the last you hear of it, which is a pity because maybe it's the starting-point of a discourse'.[66] In general the current system is viewed as something of a wasted opportunity: post-completion review, but before final and formal publication, especially if conducted as a dialogue between reviewer and creator, could be a fruitful process for the resource creators and for their eventual users, as well as for the funding body itself.

Major JISC projects occasionally allocate a portion of their budget for summative evaluation by an external consultancy, and the AHRC might consider this for large-scale, expensive initiatives. However, this is unlikely to be suitable for all projects, and a simpler model would be preferable. This project recommends a system of review that takes place after the completion of a resource but before its 'publication'.[67] A small portion of the project budget should be allocated to providing an honorarium for reviewers, who would conduct an in-depth review of the resource, to which resource creators would then be able to respond.[68] Such a review should include assessment of the project documentation. The exchange between reviewers and resource creators should be made publicly available either on the AHRC's website, the project's website, or both. 'End-of-funding programme' conferences might also be useful in terms of evaluating success, sharing experiences, pooling best practice and encouraging the engagement of the research community.

Where projects are not funded by a body such as the AHRC, this form of evaluation might be undertaken by the 'publisher' of a digital resource. A researcher might, for example, enter into an arrangement with a learned society or other subject organisation to publish online the outputs of his or her research, and it would be incumbent upon this body to undertake a rigorous evaluation of the material before ascribing its imprint.

### 4.3.3    Informal post-publication review and evaluation

Responses to survey question 10 ('What would help you to evaluate the usefulness of a digital resource for your own research?') dealt with three broad issues: provision of (post-completion) peer review or similar mechanisms; personal trial and evaluation of a resource; and information provided about a resource (which would aid in personal evaluation). Among the types of review mechanisms suggested were online guides to digital resources, independent ratings or stamps of approval (kitemarks), and ensuring that digital resources were covered by existing review systems (by which was meant, generally, post-completion, informal systems). Reviews of this type were also seen by some respondents as assisting with initial resource discovery.

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[64]    See also AHDS History report, pp. 8–9.
[65]    Focus group notes.
[66]    Stakeholder interview; 'at the end of projects, I get the feeling that the reviewers read the reports that come in; I don't get the feeling that they go and… look at the resource and prepare a statement about the qualities of the resource' (Stakeholder interview).

The focus groups convened by the project acknowledged that review is fundamentally a subjective process. When digital resources are under scrutiny, the scope for subjectivity is arguably even greater than for more traditional media: content, technical structure and presentation are all open to personal interpretation and evaluation. However, although there were differences of opinion, it was generally felt that users should be able to assess the reliability and authority of the review and the reviewer themselves.[69]

A number of possible models were discussed. A kitemarking scheme was initially viewed as a potential solution to the problem of identifying authoritative digital resources. A simple mark or logo might be included on an 'approved' website, to indicate that the resource had met a particular standard. This suggestion was relatively popular among survey respondents, and was welcomed by a minority of focus group participants.[70] However, this project concludes that a kitemarking scheme of this type is not a practicable solution to the problem of evaluating digital resources. While it might be possible to rate a resource for its adherence to a check-list of technical standards, anything more ambitious would be expensive, difficult to maintain and unwelcome. Many participants in the project expressed concerns about censorship, arising from the imposition of a centrally-controlled economy, and also about the ability to maintain such a scheme over time. Finally, it was felt that kitemarking was not compatible with the concept of peer review: 'A kitemark implies that there is some body somewhere that is empowered, like the inquisition, to say what's good and what is bad. Peer review doesn't work like that … Peer review works by spreading the authority'.[71] Most participants agreed that an improved reviewing system would be greatly preferable.

Despite this, the idea of some form of independent assessment or guarantee of quality remained popular, even among some of those who felt that kitemarks would be inappropriate.[72] There was a desire among survey respondents for there to be an independent but informed list of authoritative or valuable resources. This need is already supplied in part by Intute: Arts and Humanities, whose catalogue of digital resources includes an element of peer review.[73] Moreover, university libraries are increasingly acting as aggregators; another layer of resource discovery tools would probably only confuse matters. Other solutions that were mentioned included a central digital publisher, akin to British History Online; but again, this is a role which is already fulfilled to a degree by the AHDS, and it was thought that such a publisher would inevitably assume an unwarranted dominance.[74]

Post-publication evaluation by an independent third party would help users to assess what was offered by a particular resource. This might take the form of a straightforward check-list of features and functionality, but more exhaustive approaches were also proposed: 'a full written evaluation of features and searching strategies and pitfalls, with examples, would be very helpful. This would have to be by a scholar or scholars, however, not something written by the vendor, and it would need to be much longer than the usual "book

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[67]   Many digital resources are, of course, publicly available in some form before project completion. The crucial point here is that there should still be the possibility of responding to an evaluation, and if necessary of making changes.

[68]   Reviewers should be capable of commenting both on scholarly and technical aspects of the resource; in the early stages of such a system, collaborative reviews conducted by subject and technical specialists would be beneficial.

[69]   Concerns about peer review tended to focus on the availability of a competent peer group. Most of those consulted were confident of their ability to judge how much weight to place on the opinion of a particular reviewer, but this is, of course, dependent on the transparency of the process. Anonymous evaluation at anything other than the initial peer review stage was felt to be of little or no use.

[70]   'It was agreed that such a marking scheme might be a good idea as it might encourage resource providers to maintain their sites at a high standard' (Focus group notes).

[71]   Focus group notes.

[72]   'I do feel that there should be some central core of stuff that has got some sort of real authority. Now I don't see this as being dangerous if we follow [the] … idea that the really important thing is data … The guarantee you would be getting would be a guarantee of the faithfulness of transcription and editing rather than people's opinions about the data, or the provenance' (Focus group notes).

[73]   Intute <http://www.intute.ac.uk> [15 September 2006].

[74]   British History Online <http://www.british-history.ac.uk> [15 September 2006]. This suggestion also ignores the difficulty of preserving resource functionality on a different platform.

review" format to be of real use'.[75] While such reviews were felt to be desirable, the cost and time involved made them unrealistic. Publication of formal post-completion reviews conducted within a research council framework (see above, p. 17) would serve adequately.

A strong direction received from participants was the need for greater review of digital resources in existing scholarly journals (both print and digital).[76] Although a few such reviews have been published, the practice is not widespread; indeed, some participants struggled to think of any that had been reviewed.[77] It was considered that reviews of this type would help not only users, but also librarians and academics who had to decide which resources to acquire for their institutions, or to recommend for acquisition. Participants felt that resource creators would welcome such reviews, if positive; negative, or partially negative reviews, however, might be equally useful, in suggesting areas for development and change.[78] With such reviews accessible through search engines alongside the resources themselves, it would be an easy matter for users to assess the reviews, reviewers and resources together. This would also help in the longer term to foster a form of historiography of digital resources, which is currently undeveloped[79]

However, it was thought that it might be difficult, particularly at first, to achieve satisfactory reviews of digital resources, for a number of reasons including the varied competences of reviewers.[80] One project participant noted that a resource with which he was familiar had been reviewed in two different but equally unsatisfactory ways: 'what struck me was how patchy such reviewing was. And the reviewing process sometimes left you a bit puzzled as to what people were doing. The EH-Net review, for instance, was largely about the technical details. The *Economic History Review* article was largely about content. It was hard not to think that something was being missed here'.[81] Participants at one focus group noted that: 'In order to increase the visibility of digital resources, a seminar or conference could help to bring together journal editors, digital resource producers and research staff … Online reviews could facilitate the finding of such resources by providing a link to the site from the review.'

Several survey respondents mentioned that a forum approach to the review process would be welcome.[82] Indeed, in general a more dialogic and iterative mode of scholarly discussion, with greater interaction between creators and reviewers, and between users and creators, is desirable. There are clear resourcing issues to the adoption of such a methodology, and the potential cost of moderation is one of the reasons that it has not yet been introduced by services such as (for example) Intute: Arts and Humanities. However, there already exists some form of dialogue between users and creators – in which, for example, users point out errors, email questions, and so on, and this is likely to develop.

A final means of post-publication assessment is impact, whether drawing on citations, usage or some other measure. Metrics can, and most likely will, inform decisions about the types of resources to be funded in the

[75]  Survey report, p. 20.

[76]  'I think there is a definite plea to be made to learned journals to review e-resources' (Focus group notes).

[77]  Some reviews have been published, e.g. J. Smail, review of T. Hitchcock and R. Shoemaker, *The Proceedings of the Old Bailey, London, 1674–1834*, H-NET <http://www.h-net.org/reviews/exhibit/showrev.cgi?path=397> [27 February 2006]; T. P. Gallanis, 'Review notice: The Old Bailey Proceedings Online', *Journal of Legal History*, 26 (2005), 105–7. See also S. Collini, 'Our Island Story' (review of *ODNB*), *London Review of Books*, 27:2 (20 January 2005) <http://www.lrb.co.uk/v27/n02/coll01_.html> [26 September 2006].

[78]  'A well-reviewed website would make as much of that review as it could on its front page. You'd see the reviews as soon as you went to the website. And then you'd know what people thought of it' (Focus group notes).

[79]  '… we need to have ways of reflecting the changing views of a resource without it necessarily leading to the loss of the resource' (Stakeholder interview).

[80]  '… you have to have financial resources to pay people to do those kinds of reviews and do them well, because they require a complex array of skills… Those kinds of reviews would be best done in a collaboration; you really would probably only be able to do those with very substantial resources' (Stakeholder interview).

[81]  Focus group notes. See L. Bud-Frierman, Review of P. Wardley, *Bristol Historical Resources CD-ROM*, EH.NET <http://eh.net/bookreviews/library/0603.shtml> [25 September 2006]; E. Jones, Review of P. Wardley, *Bristol Historical Resources CD-ROM, Economic History Review*, 55 (2002), pp. 562–3.

[82]  'If you could have an open forum on digital resources with signed commentary, that would be an ideal, original format that would go miles in our understandings' (Survey report, p. 18).

future and even about the 'success' of resources which have received support in the past, but it is the view of this project that they should not be used as a significant indicator of academic value.[83] While resource creators should work to ensure the widest possible dissemination of their project outputs, and should include their dissemination plans in project applications, failure to attract a large audience is not evidence of lack of worth: a resource may be capable of having a profoundly transformative impact on only a very small section of the academy.[84] Nevertheless, if a resource is designed for a broader audience, it is important that it attracts that audience, and creators need to be able to demonstrate how this will be achieved.

### 4.3.4    Measurement of technical standards and best practice

While best practice is constantly evolving, it is not unreasonable to expect resource creators to adhere to a basic set of common standards agreed, and regularly reviewed, by their peers and implemented through the research councils.[85] The JISC, for example, expects applicants to display a knowledge of current standards, that the standards to be used should be laid out in applications, and that the project should be capable of conforming to the JISC Distributed Information Environment. Clarity with regard to what projects are expected to deliver in this area would greatly assist the review and assessment process. A set of standards or best practices would best be defined by the community working as a whole, under the auspices of organisations including AHDS and the ICT Methods Network.[86] Applicants for funding should define the standards to which they intend to adhere at the technical stage of an application, whatever form that may take. However, it would be counter-productive for resource creators to be constrained by a set of standards where innovation was more appropriate; project teams should be able to use non-standard tools and methodologies, and should use the technical application to argue why they intend to use such tools and what the benefit of them will be.

A strong need for adequate project documentation was identified by many of those consulted by the project, both to assist the user and to inform the assessment process. Respondents to the project survey noted lack of adequate information about a resource (its scope, its creators, its methodology, its development and future maintenance) as an important barrier to usage. Documentation not only assists current and future users, but also those bodies which are tasked with preserving and updating a resource.[87] Some resources require more than others; for example, a database might need substantial ancillary documentation to make sense.[88] There are concerns about the time taken to produce full documentation, and it might be that a month should be set aside at the end of a project for its revision and compilation, although this has obvious funding implications. Project documentation should be included in a post-completion/pre-publication review system, and potentially altered or updated to reflect comments and suggestions for development.

The adoption of technical standards and good documentation are vital if resources are to become interoperable, which is seen as a key feature by many users.[89] The issue of scholarly standardisation (as opposed to standards) is also of importance, if genuine interoperability between resources, and a genuinely strategic approach to

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[83]    See also AHDS History report, pp. 34–6. If usage does become part of an assessment of value, it is important that the assessing body should specify the measuring tools to be used.

[84]    '… [project applicants] need to be explicit about how their resource is going to be taken up; and if they think it's only going to be the one scholar, it doesn't necessarily mean it's inappropriate, or not worth funding, but we need to consciously recognise what value this will actually have' (Stakeholder interview).

[85]    Researchers submitting proposals to research councils should be able to make a case for using non-standard applications, and innovation should be allowed to flourish wherever possible, but accessibility, usability and interoperability should be key considerations.

[86]    'I think if you're creating a resource that you want to have longevity, that you would like to see other people use, then I think standards are extremely important and I think it's really beholden on the community to sit up and agree what those standards should be, and work to those standards to the best of their ability' (Stakeholder interview).

[87]    'One of the things I think we could usefully have is some form of methods for capturing the decision-making process … maybe some workflow tools that we could build in, that help us understand how the resource was created, and some of the thinking processes behind it' (Stakeholder interview).

[88]    AHDS History report, pp. 21–4.

[89]    '…the AHRC needs to insist that people provide core content which is interoperable, obviously searchable so you can get to it through Google, and obviously it has to be XML' (Focus group notes).

digital provision, is to be achieved. At the moment, standardisation is seen (for history) as something that is developed in an *ad hoc* way by individual bodies; it appears to be more highly developed in archaeology.[90] However, where common standards are not applied, or clear statements made about the standards adopted, researchers are forced to check data before reusing it, negating some of the benefits of working with online resources. Nor can resources be linked in ways which will open up new opportunities for researchers.[91] There is perhaps a role for learned societies in developing the definition of such standardisation at a subject level, where it does not already exist.

### 4.3.5    Who should undertake peer review and evaluation?

A recurring theme in discussion was the concern over the degree to which scholars in the arts and humanities are equipped with the skills effectively to review and evaluate digital resources. There was recognition that this is a developing landscape, and that peers will develop along with it. However, many participants felt that it would be difficult to find scholarly peers who were capable of assessing all the aspects of a digital resource (given difficulties in finding peer reviewers in the existing environment). This was a particular anxiety for those facing a funding decision, both in terms of whether a reviewer is competent to judge, and whether review criteria are being applied consistently. The 'Right of reply' recently instituted by the AHRC was deemed to go some way to addressing these concerns, but it had also paradoxically in some cases reinforced a lack of confidence in the process.

The benchmarking exercise conducted in the past few months suggests that, where appropriate guidelines are provided and reviewers are carefully selected, the process can work. That careful selection, however, is key to encouraging confidence in and support for the system, and to addressing concerns about competence and fairness. While alive to anxieties about the imposition of an overly-centralised model, it is the conclusion of this project that learned societies (and other, similar organisations) have an important role to play in establishing a robust mechanism for peer review and evaluation and in overcoming such cultural resistance as still pertains. The Advisory Board established for this project could serve as a template for other disciplines, effectively replicating the functions of a traditional editorial board. In some instances, as during the present benchmarking exercise, members of a panel or board might undertake evaluation themselves, but their primary task would be the identification of suitable peers from within the wider academy. Consultation between learned societies and bodies such as the CCH and the HRI, as here between the Advisory Board and Technical Advisory Group, is also to be recommended, particularly, as noted above, until such time as the skills gap is addressed.

### 4.3.6    Criteria for peer review and evaluation

Given the wide variety of digital resources currently available, both in terms of content and means of delivery, there is potentially a huge range of criteria to be considered in any evaluation, not all of which will be relevant to any one particular resource. A digital monograph, for example, would be reviewed in a different way from a digital edition, a finding aid in a different way to a prosopographical database. A useful way of deciding which criteria are relevant for a particular resource is to examine its statement of intent: what is it aiming to be; who is it aiming to serve?[92] As with any research output, digital resources are most usefully evaluated in relation to whether they have achieved, or even exceeded, their aims, not criticised for failing to deliver beyond their remit.

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[90]  'I think … that the typology of archaeology is more of a fixed point, more open to definition of standard terminology. The convention of the field is to have very clear categories' (Focus group notes).

[91]  This was particularly seen to be the case with large projects such as the Portable Antiquities Scheme, often with submission of material from a range of contributors with differing levels of skill and experience: 'The problem is that there is no real central control when it comes to terminology used to identify particular objects. And even where there is a preferred central terminology there is no system in place to ensure that the local finds identification officers use it correctly' (Focus group notes). Portable Antiquities Scheme <http://www.finds.org.uk> [15 September 2006].

[92]  'Assessing "fitness for purpose" would involve different criteria for different groups of end users, and exclusivity should be avoided' (Focus group notes).

For a full list of criteria which could be applied to the evaluation of the strictly technical elements of a resource, the AHDS History report compiled for this project should serve as an example of best (or ideal) practice.[93] However, for peer review, some considerations might be slightly different, particularly as it concerns the assessment of the content, scholarly interpretation and research potential of a resource. This project uncovered considerable differences of opinion about the relative importance of structure, interface, content and added value. Although content was rated as the most important criterion in the survey (see above, p. 9), other aspects of a resource should not be neglected in a review.[94] Similarly, a review that concentrated purely on the technical aspects of a resource would be likely to appeal to a more limited audience, and indeed to be of limited practical benefit to the majority of users. Where a review is commissioned after the publication of a resource, rather than as part of the first-stage peer-review process, the problem is more tractable: a review commissioned by a humanities computing journal might focus on the technical architecture of the resource, while a review for a general, popular journal might concentrate on the ways in which the resource could be used for individual research.

The issue of whether content can or should be separated from technical structure at this stage of review is problematic. Many members of the academy would probably concur with the opinion of one focus group, where 'It was generally agreed that content could be completely divorced from the technical standards'.[95] However, in interviews with individual participants, and in resource creators' focus groups, it became apparent that many of those who create and use digital resources for research regard content and technical structure as interdependent. For example, the construction of a database or system of mark-up involves important and informed scholarly decisions:[96] 'I think in the digital world you can't see [academic content and technical issues] as separate, because I think the decisions that you make about the technologies you want to use, the kind of standards you might apply, will have some impact on what you're doing on an intellectual level and a content level'; 'There is a relationship… because you could have data of very high academic quality, but if that data really only exists if people can access it in a philosophical sense, then it is inseparable from the technical issues of the interface.'[97] It therefore seems important for reviewers at all stages to recognise that content and structure do not function discretely in a digital context. Furthermore, for those in the information services sector, technical issues are 'equally important in terms of making decisions about purchase, about making material available, about whether this material will be used academically by the academic staff, and the students in the institutions, so… it's absolutely right in the core alongside the content in terms of whether you make that material available or not'.[98]

Finally, reviewers need to be encouraged to engage with the value-added element of digital resources, to make an attempt to evaluate and predict their transformative impact. As noted above, the project survey revealed that this inevitably intangible and highly subjective aspect of assessment is not always fully recognised or expressed. However, uniquely for digital resources, a reviewer may be able to identify significance, and potential uses, which had not been envisaged by the resource creators themselves.

### 4.4    Sustainability

The issue of sustainability is perceived to be of vital importance for digital resource provision. One focus group, for example, noted 'major anxieties about the sustainability of digital resources and the need to guarantee the great, long-term costs, whether by HEIs or the government'.[99] A participant at another commented that 'It

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[93]    AHDS History report, pp. 42–5.

[94]    '… [focusing on content] was possible, but … one would then miss the opportunity to describe the ways in which it could be used' (Focus group notes).

[95]    Focus group notes. 'Technical standards' tended to be used as a rather unhelpful 'catch all' term.

[96]    AHDS History report, pp. 25–9.

[97]    Not all of the people consulted shared this opinion: 'if you're looking at technical issues at quite a high level, in terms of technical standards and so on, then they probably don't affect [academic content] that much'; 'I realise there is a close inter-relationship between the two, but … you can differentiate between them … you could have a really fantastic technical architecture with absolutely rubbish intellectual input, and you can have the reverse as well' (Stakeholder interviews).

[98]    Stakeholder interview.

[99]    Focus group notes.

was impossible to produce a trusted site unless there was investment in long-term maintenance'.[100] Scholars are more likely to be unwilling to use a resource and to cite it in their work if they do not believe that it will continue to be available. This issue is particularly vexed in some cases because of the requirement to support both academic and technical sustainability, updating content and migrating data to new platforms as necessary; and it is acute, because some providers are not necessarily reliable long-term hosts for digital materials. Moreover, given that universities may only have funding to support resources for a limited term, the need to find a solution is paramount. The AHDS is the body tasked with preserving research project inputs. However, deposit of datasets with the AHDS is not enforced; it would be appropriate for the AHRC to ensure that it is.[101]

Up-to-dateness, or the impression of up-to-dateness, is important both to users and creators of digital resources. The issue of updating a resource (both to make corrections and to add new information) after the funding period has ceased is also a problem. Such post-publication activity is likely to be less arduous than the initial creation, but in many cases it is essential to the ongoing relevance and utility of a particular resource.[102] Any solution to this problem is likely to require investment, whether from funders, from libraries or from projects' host institutions. It is possible to envisage a centralised model of maintenance, and despite the costs and organisational challenges that this option would involve, it merits serious consideration, in conjunction with others. It is the view of this project that sustainability is of such importance that some substantial investment ought to be made, and a devolutionary strategy devised, by the AHRC itself. A number of ancillary measures ought also to be considered: postdoctoral researchers using a particular digital resource intensively might be required, under the terms of their funding, to update and maintain that resource; small sums might be made available to the original project teams to update their resources in subsequent years. The informal involvement of the research community, perhaps through the use of the burgeoning wiki technology, would have the advantage of cost-effectiveness.[103] But any such local and *ad hoc* measures should not be considered a substitute for overall AHRC responsibility.

### 4.5     *Recognition of humanities computing input*

Humanities computing specialists are recognised as contributing significantly to the development of digital resources, providing services and support which could not reasonably be expected of purely technical project officers. Humanities computing specialists themselves see their work as 'technical-academic' or 'scholarly-technical' rather than simply 'technical', and are concerned to develop a new vocabulary or typology to discuss such issues. This would serve to raise awareness of the work involved in developing digital materials, something which was expressed forcefully by all of the resource creators consulted during this project.[104] There was a clear demand for greater recognition of the largely unheralded work that is undertaken at the intersection of the technical and the scholarly, and for such work to be given due merit in academic promotion processes.

A participant at the CCH meeting noted that resource creation projects are often so timed that not only do the academic project directors have little time to produce supporting scholarly material, but also that scholarly-technical workers have little or no opportunity to reflect on the development of the project, and to

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[100]  Focus group notes.

[101]  Members of the project team on occasion encountered the view that deposit with the AHDS was a guarantee of the quality of a particular resource: 'their [AHDS's] acceptance of a resource for deposit indicates that it is technically acceptable' (Focus group notes). This is clearly not the case – many materials deposited require a great deal of intervention from AHDS staff – and the exact nature of the deposit agreement needs to be clarified.

[102]  The question of 'academic' sustainability affects digital resources to varying degrees. Some resources, for example bibliographic databases, rely in large part on their currency, while others, for example an online edition of a text, may never require significant post-publication intervention.

[103]  One project of this type is the PhilosophyWiki at the University of York (currently in beta testing) <http://www.philosophywiki. org> [27 September 2006].

[104]  'My work is classified by my institution as "Clerical, related, and other", not computing … not research or research-related, it's just "other"'; 'I won't work on anything if the word "technical" appears anywhere near my name, because to people in the humanities that means secretarial work'; 'lots of stuff that could be demeaned in a class-ridden culture by certain people as being technical is not merely technical at all, it requires a great deal of ingenuity' (Focus group notes).

produce supporting and spin-off material that might help to develop their careers. Recognition of scholarly-technical work is important not only for the careers of the increasing numbers of academics who work on such projects and in humanities computing centres, but also potentially for exercises such as the RAE. In addition, the intellectual development of the field would benefit. It therefore seems appropriate to suggest that some 'time for reflection' might be built in at the end of a project, tied in with the post-completion, pre-publication review suggested elsewhere in this report.

*4.6     Broader cultural change*

The need for a cultural change was mentioned by several project participants, by which was meant a change of attitude towards digital resources and their creators, and towards their use for scholarly work.[105] It was thought that this change was in process – indeed, it was pointed out that many academics already implicitly trust the digital medium, using email as a regular means of academic correspondence, and regularly consulting digital resources.[106] Nevertheless, there is still a gulf between science, technology and medicine, and the arts and humanities when it comes to levels of comfort with digital resources and environments. The disparity was thought to be less of an issue for archaeology and some of the social sciences, but more significant for the creative and performing arts. This lack of confidence and familiarity with digital resources might well affect those academics who are involved in peer review panels for funding bodies (or other types of peer review), particularly if they are being asked to consider digital and non-digital resource applications side by side.

Other measures of esteem were frequently raised during the project. Inclusion in library catalogues, for example, was seen as desirable (and in a sense a form of review, since it conveys that an authoritative body considers the resource of value). Peer recommendations also functioned both as a means of resource discovery and of indicating that a resource had value. A particularly important issue was that of citation by scholars in their published work; it was thought that while academics frequently use digital resources, they may be reluctant to cite them (considering that they are not felt to be as authoritative or credible as print sources or manuscript originals) and may be using them as surrogates while citing the original.[107] This situation will change over time, but the development of citation conventions for digital resources (which already exist in some cases) will serve to speed up the process. Editors and copy-editors of scholarly journals have a role to play here, encouraging authors to cite digital resources as well as, or in preference to, print.[108] 'Notes for contributors' and 'Style guidelines' should include journals' preferred methods of citation.[109]

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[105] The problem is not confined to the UK. A recent ACLS report recommended 'policies for tenure and promotion that recognize and reward digital scholarship and scholarly communication', noting that 'There is a widely shared perception that academic departments in the humanities and social sciences do not adequately reward innovative work in digital form … in the most elite universities traditional scholarly work, in the form of the single-authored, printed book or article published by a university press or scholarly society, is the currency of tenure and promotion, and work online or in new media – especially work involving collaboration – is not encouraged' (*Our cultural commonwealth: report of the ACLS commission on cyberinfrastructure for humanities and social sciences* (26 July 2006), p. 52 <http://www.acls.org/cyberinfrastructure/acls.ci.report.pdf> [8 September 2006]).

[106] '… the fundamental feature of this is that even people who are still within print culture are online two or three hours a day, they're emailing, they'll look at EEBO... they're already part of online culture, they already trust it, they already treat it as reliable' (Focus group notes).

[107] 'I think that a lot of academics are still quite wary of referencing web pages, even something which is clearly a good site, like Old Bailey Online; we're more likely to put the footnote to "Proceedings of the Old Bailey…", making it look like we've looked at the Proceedings at the British Library' (Focus group notes); 'we need to put more emphasis on the notion of citation. And that would give us some ideas about how these resources actually impact on research' (Stakeholder interview).

[108] With 90 per cent of learned journals now delivered online instead of or as well as in print (the figure is 84 per cent for the humanities and social sciences), it no longer makes sense to cite a print work over a digital resource (*Scholarly publishing practice: the ALPSP report on academic journal publishers' policies and practices in online publishing* (2nd edn., 2006) <http://www.alpsp.org/publications/SPP2summary.pdf> [27 September 2006]). To do so will, in fact, impact negatively on the reader, who will be unable to follow a link to the material being referenced.

[109] There are a number of extant guidelines, e.g. those provided by the Modern Languages Association <http://www.mla.org/style_faq4> [15 September 2006] and the Modern Humanities Research Association <http://www.mhra.org.uk/Publications/Books/StyleGuide/download.shtml> [15 September 2006], but idiosyncrasies and uncertainty persist.

Finally, there needs to be a recognition that there is more than one model for research in the arts and humanities. Traditionally, the most valued research outputs have been the work of lone scholars – while journal articles may be written by two or more researchers, there are no multi-authored monographs. The creation of digital resources, by contrast, almost always involves collaborative or team working, whether between individual scholars or between researchers and their supporting computing departments. The academy needs to place due value not just on the outputs of collaborative research, but on the work itself.

## 5 Recommendations

1    At present, all applications to the AHRC with a significant digital element have to include a 'technical appendix'. An alternative method of demonstrating and assessing the technical elements of a research project should now be introduced as, in the view of this project, the technical appendix is no longer a reliable indicator of the robustness of methodology or project planning.

2    The AHRC should consider adopting a two-stage application process: an initial summary submission assessed for scholarly value; and a second, more detailed, submission, incorporating the information currently relegated to the separate technical appendix. This would encourage both applicants and assessors to view the project as a whole, while retaining emphasis on the importance of content.

3    Peer reviewers should be chosen primarily for their subject expertise, but their ability to understand and assess the technical elements of a proposal should also be taken into account. If, in the short to medium term, there is an insufficiently large pool of qualified reviewers, review by a subject specialist in conjunction with a humanities and computing practitioner should be considered.

4    Learned societies and subject organisations should be encouraged to assist the AHRC in the selection of appropriate reviewers, both at the initial peer review stage and during subsequent assessments. A board or panel such as the one established for this project might usefully be set up for other humanities disciplines.

5    There should be greater investment in the training of researchers to evaluate and use digital resources. Learned societies have a significant role to play in ensuring that their communities engage with the issue, and university libraries and computing centres should be encouraged to provide training to mid and late career academics as well as to new researchers.

6    Post-completion/pre-publication assessment of digital resources should be conducted, with both the evaluation report and any response from the resource creators published on the AHRC and/ or respective project websites. The review process should be open, with all comments attributable. The AHRC and other funding bodies should make provision in funding awards for the payment of honoraria to reviewers.

7    Post-completion review should be conducted in a spirit of openness, so that resource creators are encouraged to discuss freely any problems which they have encountered and any innovative solutions that they have adopted, for the benefit of the research community as whole. Legitimate departures from an original project plan should not be viewed negatively when considering subsequent applications.

8    Scholarly journals should be encouraged to commission reviews of significant digital resources, and to publish them routinely alongside reviews of monographs and collected essays.

9    Where reviews of digital resources are published online, resource creators should be offered a right of reply. In this context, a closed or adversarial review process should be strongly discouraged, in the interests of fostering debate. A digital resource can, funds permitting, be adapted to take account of considered and informed criticism in a way which is clearly not applicable to the print review process.

10    In order to ensure a relatively level playing field, reviewers of digital resources should be presented with a set of guidelines, advising them as to the elements which they should consider. The 'Guidelines for reviewers' produced as part of this project should be transferable, with minimal alteration, to other arts and humanities disciplines.[110]

11    Common and widely-publicised citation standards for digital resources should be established. Resource creators should be encouraged both to include citation instructions on their project websites and to maintain permanent URLs.

12    Intute: Arts and Humanities should be encouraged to disseminate and/or link to post-publication reviews of digital resources, in addition to the resource descriptions that it currently provides.

13    Any assessment of research activity, at either institutional or national level, should give due weight to time spent in the creation and development of digital resources. The system of peer review and evaluation proposed by this project is one means of ensuring that digital resources are properly assessed, and consequently amenable to consideration in, for example, the Research Assessment Exercise.

14    Due recognition should be given to work undertaken on a collaborative basis, a well-established pattern in the scientific disciplines. A digital resource should not be viewed as the creation of, for example, a single lead applicant or project director, but as a collaborative exercise to which all members of a team have made unique contributions.

15    Levels of usage should not be viewed as a key indicator of the scholarly value, or even impact, of a resource.

16    Questions of the academic sustainability of digital resources have tended to be neglected, because of their perceived intractability, but should be given due weight alongside technical and financial concerns. There is much to be gained from the wiki model, allowing scholars to correct and enhance resources in a relatively *ad hoc* manner, although mediation and attribution are essential in an academic context. However, if the most complex and wide-ranging resources are to retain academic currency, substantial investment should be made, and a devolutionary strategy devised, by the AHRC, in collaboration with learned societies and other subject bodies.

17    A kitemarking system should not be adopted for the arts and humanities.

18    Any system of evaluation or review should not adopt a simple 'pass/fail' approach when considering a digital resource in its entirety. It is, for example, possible to conceive of a technically-flawed project which nevertheless has substantial scholarly value. Subjectivity is vital to the assessment process, and should not be masked by any more rigid system of indicating 'approval'.

19    A check-list of basic technical standards should be developed to assist in the process of post-completion review. This is distinct from the assessment of 'technical-academic' elements of a project.

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[110]  Individual scholarly journals may, in addition, have their own stylistic criteria.

**Acknowledgements**

## Appendix 1: Guidelines for reviewers

In assessing a digital resource, it is important to consider content, usability, presentation and 'added value'. A review should begin with a description of the resource, and then consider its role and purpose in a wider context, both historiographical and technological. Does it, for example, stand in scholarly and/or digital isolation? How innovative and/or significant is the resource? The review should consider the 'added value' of digital over print delivery in the context of the resource under discussion.

It would be appropriate to comment on the availability and clarity of any project documentation. Is it, for example, readily apparent what the resource contains, the scope and limitations of its coverage, the technical and scholarly criteria that have been applied, and the intended audience? Is there a statement of authorship?

There are several areas on which you might like to focus in your review, many of which are overlapping:

- Content – Is the content of the resource clearly explained? What is its scholarly value and significance? Have transparent and rigorous scholarly standards been applied in the selection and subsequent handling of the material? Depending on the nature of the resource, it might be useful to include examples of sample searches that you have conducted. Were the results accurate and appropriate to the intended purpose of the resource? Or were they inaccurate and/or irrelevant? Did the search results demonstrate new and interesting research possibilities?
- Usability (including ease of navigation) – Has the resource been well structured? Can the resource be easily browsed and/or searched? If the resource employs any classification schemes, have they been well constructed and consistently applied? Are there both simple and advanced search facilities? Is there a clear 'Help' facility? You might also wish to consider the speed of any web resource, and whether or not the user has to download additional software in order to use elements of the resource.
- Added value – What does the resource add to the field? Does the material contained in the resource benefit from having been made available digitally rather than (or in addition to) in print? Have the resource creators considered a sufficiently wide range of uses beyond print? Is it important that digital presentation should add value, or is it simply enough that the material is made available at all? Has the project fulfilled its intended purpose? How flexible is the resource? Has it been designed in such a way that future developments can be easily incorporated?
- Technical standards – Is there a clear statement of the standards that have been used, and an explanation of their benefits and/or limitations? Have the data been well constructed? Do the creators of the resource appear to have given consideration to its preservation (e.g. through the adoption of open standards)?
- Presentation (layout and design) – What does the resource look like? Is it important for the resource to be attractive, or is this irrelevant to its value? Is the resource overly complex or appropriately designed?
- Authority – Is it easy to establish who has created the resource and where it is hosted and/or published? Who has provided funding for the resource? Is it possible to determine the longevity of the resource? How would you assess its reliability and long-term value?
- Audience – Does the resource make clear its intended audience? If audiences with different levels of knowledge are envisaged, have the creators of the resource given this sufficient consideration?

Finally, reviews should aim to be professional, courteous and constructively critical.

## Appendix 2: Check-list for technical standards

**1.    Very general**

*1.1    Location/ name*
- Resources should be memorably named.
- Resources should not be hidden within institutional websites.
- Resources should be easily navigable within an institutional context (i.e., how easy/difficult is it to navigate out of the site?).
- The relationship between the resource's site and other related sites should be clear.

*1.2    Funding bodies*
- Resources should be 'badged' according to the funding bodies' requirements. Approved logos of funding bodies and lead institutions where applicable should be displayed at the start (access) page of the resource.

*1.3    Aesthetics*
- Resources should not offend aesthetical sensibilities.
- Resource creators should, whenever possible, consider the use of white background and black text.

*1.4    Enlarging and decreasing text size*
- Resource creators should ensure that it is possible to alter the size of the text while browsing the resource.

*1.5    Quality of reproductions*
- Quality assurance controls should be implemented throughout the life-time of the project.
- The quality of a reproduction of a published volume should not be lower than the original.
- Care should be taken in describing any image manipulation which has taken place during the digitisation process which may affect the users' ability to interpret the original document.

**2.    Technical**

*2.1    Technical standards*
- Resources should be compliant with general technical standards.

*2.2    Accessibility*
- Resources should be compliant with general accessibility standards and CENDAR requirements.
- Resources' claims to technical and accessibility standards adherence should match actuality.
- In case of non-adherence to particular standards, resources should outline in their documentation the reasons why those standards are not being followed.
- Resources should have flexible screen widths.
- Resources should not use pop-up windows unless necessary.

*2.3    Software usage*
- Resources should strive to use open source components.
- Resources should be usable in multiple common browsers.
- The functionality, accessibility and sustainability of the resource should be considered whenever contemplating the use of JavaScript to support its dynamic content.

**3.     Usability/Accessibility**

*3.1   Navigation*
- Navigation should be enhanced by the presence of clear back and forward links to sections on the site as well as return to home page button.
- Browsing the resource using only a keyboard should be enabled.

*3.2   Searching*
- Resources should allow simple and advanced searching facilities.
- Enough provisions should be made so that to make as much as possible of the tagged data/ metadatacan be searched.
- If thesauri/controlled vocabularies are used in searching, documentation explaining how this is being done should be made available to the end user.

*3.3   Browsing*
- Resources should be built so that the paths from the home page to the historical  material  are as clear as possible
- Navigation through the material using a browse facility should be both obvious and easy.

*3.4   Accessibility*
- Resources should contain an accessibility statement.
- Resources should ensure that screen-readers can be used appropriately.
- Resources should, whenever possible, avoid the use of proprietary plug-ins.

*3.5   Downloads*
- Information detailing which data is available for download and in which format(s) should be made available to the user
- Resources should make citations to source available for download and should ensure this information is easily accessible to the users.
- Help files should also be provided if appropriate.
- Uniform Resource Identifiers (URIs) should be provided for each of the constituent pages of a particular resource.
- It is recommended that usability tests be conducted and that details of these tests are made available to the users of the resource.

**4.     Page content: general**

*4.1   Writing style*
- Creators should avoid the use of the passive tense and the writing of text which could be deemed verbose.
- Sentences should be written using a small number of points per paragraph.
- Users should be able to print, if not all, most of the available texts.

*4.2   Credibility and authority*
- Extreme care should be exercised to check the entire text of the resource for grammar, spelling, and or textual inconsistencies.
- Thorough checks should be made to ensure there are no broken links.
- Substantial authorial information should be incorporated to the resource so as to provide users with a good indication of the satus of a resource.
- It should be made clear when a resource was first made available and when it was last updated.
- If a resource is 'in progress' it should have record-level information about the currency of particular records.

**5.    Documentation**

*5.1    Selection process*
- Resources should include a clear statement of why any particular resource is made up of its constituent parts.

*5.2    Content*
- Resources should also include a detailed statement of what is actually within the resource.

*5.3    Digitisation workflow*
- Information about the process(es) by which all elements of the resource were digitised should be given.
- For projects which involve tagging of information, a document detailing their data modelling strategy should be included. This document should ideally contain information on tagging and transcription policies and editorial rules which were followedduring digitisation.

*5.4    Standards compliance*
- Documentation should also comprise a statement of all published standards used and details of any modifications implemented witin the resource which are undocumented elsewhere.

*5.5    Rights management*
- A clear statement of all issues related to rights including any other terms and conditions should be available.

*5.6    Functional and technical specifications*
- If the resource is available online, particularly through interactive web browsing, additional documentation relating to the functional and technical specification of the web site should also be provided.

*5.7    Availability of documentation*
- Prose format documentation should be provided even if much of the information is also provided within preservation-level metadata.

This check-list is taken from a report provided by AHDS History.

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